Chapter 43

Employing a Three-phase Design-based Research Methodology for Expanding Student Teachers' Language-related Literacy Practices in an Egyptian Pre-service English Education Programme

Mahmoud Abdallah

SLO • Netherlands institute for curriculum development

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Abstract

The chapter reports on a case of a research study that investigates the possibility of expanding Egyptian pre-service EFL student teachers' language-related literacy practices by integrating some web-based new literacies into their education programme.

After an overview of the rationale, objectives, and research problem, a detailed argument is provided to rationalise the choice of DBR for the purposes of the study based on some epistemological considerations, and to explain why it has been preferred to other prominent research methodologies (e.g., experimental design, interpretivist research, and action research). Moreover, a special focus is given to pragmatism as a basis of DBR. This is followed by a review of the specific design-based research (DBR) methodology employed (i.e. a three-stage research framework): (1) the preliminary phase, which acts as a theoretical and empirical foundation; (2) the prototyping phase of two iterations; (3) the assessment/reflective phase presenting a final design framework for expanding EFL student teachers' language-related literacy practices.

My main focus here is on the three-phase research design and the procedures followed in the prototyping phase to highlight DBR as a process, and thus provide readers with a practical, contextual example of how DBR can be employed in reality by doctoral students.

1. Introduction and rationale

Globally speaking, current advances in modern technologies have created a need for reconceptualising old notions of literacy centred on the ability to read, write, and comprehend printed texts, especially within language learning contexts. The Internet calls for new forms of reading, writing, and communication in this information age.

Today, literate individuals should know how to gather, analyse, and use information resources to solve problems and accomplish certain goals. This has become crucial within English language learning (ELL) contexts where learners are required to use English for a variety of communicative and functional purposes.

As far as language teacher education is concerned, new literacies have become of great concern in educational institutions. Nowadays, teachers in the field face many challenges related to technology and literacy. They are challenged to engage students in emerging new literacies (e.g., online reading and writing), which can be regarded as natural extensions of the traditional linguistic aspects. Teacher education is the means through which new literacies can be integrated (Abdallah, 2011b).

2. Problem of the study

My identification of the problem started while I was administering my MA programme on oral language skills to a group of EFL student teachers in Egypt, which I reported in a recent book (Abdallah, 2010). These interactions fostered a feeling that the learners needed to expand their literacy practices by integrating the Web into their education programme.

Further, I conducted a short investigation (Abdallah, 2011a) with a purposive sample of 30 EFL teacher educators and senior student teachers that was seen as sufficiently representative for Assiut University College of Education (AUCOE) in Egypt. In response to online semi-structured interviews, all participants indicated that EFL student teachers at AUCOE: (1) did not receive any training in the college on using the Web for ELL purposes; (2) were not provided with adequate or systematic opportunities to use the Web throughout their education programme; (3) believed in the great promise the Internet holds for ELL; and (4) experienced difficulties in using the Web for academic purposes (Abdallah, 2011a).

A review of EFL programmes in Egypt reveals that the knowledge base represented in the undergraduate courses is not sufficiently updated to address Web-based new literacies and applications in English language teaching (ELT) and ELL. Similarly, a review of empirical studies conducted in the Egyptian context reveals a lack of theorisation regarding the implementation of ICTs in general and the Web in particular, for educational and language learning purposes, especially in the context of pre-service EFL teacher education (Abdallah, 2011b).

From a curriculum design perspective, EFL curricula in the pre-service teacher education programmes, with specific reference to AUCOE, are pre-designed from a 'fidelity' perspective that requires abiding by strict rules and guidelines during implementation regardless of the specific context, rather than from an 'enactment' perspective that considers the real teaching-learning process in schools as a major resource for informing the curriculum design process. Thus, EFL student teachers at AUCOE lack the necessary knowledge, competencies, and skills required to use the Web for language learning purposes. Hence, a design framework that involves principles and guidelines for expanding EFL student teachers' language-related literacy practices by integrating some Web-based new literacies into the target context, is sought through the study.

3. Research objectives and questions

The objective of the study was to explore the possibility of expanding the language-related literacy practices for Egyptian EFL student teachers in the context of their pre-service education programme, with specific reference to AUCOE, by integrating some Web-based new literacies into this programme. Accomplishing this aim can be realised through the accomplishment of some objectives represented in:

1. Identifying those Web-based new literacies that EFL student teachers currently need as well as those Web-based facilities useful to them, and why and how they might be useful in this context;
2. Establishing a design framework that includes principles and guidelines for expanding Egyptian EFL student teachers' language-related literacy practices.
3. Generating implications that inform the curriculum design process within Egyptian pre-service EFL teacher education programmes.
4. Introducing new methodologies and products into the Egyptian context (e.g., DBR).

To realise the objectives described above, the following questions were addressed:

1. What is the range of Web-based new literacies that Egyptian EFL student teachers need in the context of their pre-service teacher education programmes to cope with the increasing use of ICTs in TEFL?
2. Which Web-based facilities are beneficial to Egyptian EFL student teachers, and why and how can they be beneficial?
3. Which design principles are effective as guidelines for expanding the language-related literacy practices of Egyptian EFL student teachers at AUCOE through integrating some Web-based new literacies into their education programme?
4. What are the implications of the suggested design principles for EFL curriculum design in the target context of AUCOE?
5. What are the methodological implications of employing an educational design-based research (DBR) methodology along with some innovative techniques for data collection and analysis, for the Egyptian context of educational enquiry?

4. Research methodology and procedures

Rationale and range of possibilities

The research objectives and questions discussed above entail generating a design framework that includes some design principles to be tested through short interventions. To realise this main goal, a range of research methodologies could be used, such as experimental research, action research, and formative evaluation, all of which sound similar to design-based research (DBR).

The experimental research design (ERD) is the most popular approach in Egypt. At first glance, ERD seems an appropriate design since it involves pre-post testing. However, it is not the right fit for two main reasons: (1) In ERD researchers want to compare an experimental group with a control group. It is not 'fair' to place an innovative intervention that is still in a 'prototype' stage in an experiment 'against' a control situation; (2) when one strives in an intervention for 'innovative' educational goals, there might not be an appropriate control situation for an experiment. It is often better to apply a 'criterion-referenced' approach (i.e. test the intervention against the required goals) (Nieveen, 2009; Plomp, 2009)

Realising this problematic issue, Brown (1992) and Kelly (2007) present some major differences that distinguish the two approaches (see Table 1):

Table 1: Comparison of experimental design and design-based research

Category	**Experimental research**	**Design-based research**
Orientation	Controls variables	Characterises the situation
Location	Artificial laboratory settings	Messy, natural learning/teaching situations
Procedures	Follows fixed procedures	Follows flexible procedures to refine designs
Learning	Values isolated learning	Values social interaction
Hypotheses Testing	Tests hypotheses	Generates/Cultivates hypotheses

At the other extreme, the interpretivist research paradigm (IRP) seems a good alternative. However, despite the in-depth analytical accounts it provides, IRP does not interfere directly to change or improve educational reality by examining theory in context.

In terms of connecting theory to practice, action research and formative research are two approaches which seem similar to DBR, and hence might be appropriate for my purposes. Some researchers confuse DBR with action research, but what makes DBR different is that it does not simply aim to refine a design intervention toward improving practice, but also to refine theory and provide some useful design principles (Bielaczyc & Collins, 2007). In addition, in DBR there is an engineering approach to design, especially as far as computer environments and innovations are concerned. This emphasis in particular might take DBR away from action research.

Formative evaluation is closely related to DBR since both are naturalistic, process-oriented, and iterative involving creating tangible designs that work in complex social settings. However, formative evaluation does not entail theory generation as a goal; rather, its goal is to improve the practice of design (Barab & Squire, 2004).

Generally, DBR is convenient when there is an intent to produce new theories that account for learning/teaching in naturalistic settings (Barab & Squire, 2004), and to provide insights and contributions for improving educational practice (Plomp, 2009). In this way, it functions as a means of bridging the gap between theory and practice by addressing real educational problems based on which design frameworks are developmentally formulated and enacted. Moreover, since improving educational practice, especially in teacher education, has become an important aim of research in Egypt, there is a need to introduce DBR as a new paradigm that aims at improving both theory and practice, and as a means of building local theories based on realistic practices and interactions in the context.

In this sense, educational DBR can be more appropriate than ERD, which has not succeeded in producing strong theoretical arguments and rigorous results that link theory to practice, or presenting principles for practitioners to consult when faced with practical problems, especially in the Egyptian context. The nature of the curriculum and methodology topics in the Egyptian context needs a flexible paradigm under which some quantitative and qualitative methods can be combined to achieve certain objectives (Abdallah, 2011b).

Drawing on the above arguments, DBR appears the most suitable paradigm here for the following reasons:

1. Research objectives should inform the choice of methodology, not the other way around. Thus, researchers must be eclectic in their search for truth (Pring, 2005), choosing the paradigm and methods that fit in with their research objectives.
2. DBR addresses complex problems whose solutions cannot be easily suggested without investigating the context and experimenting with preliminary designs (Plomp, 2009). The study addresses a complicated problem for which there are no ready solutions.
3. DBR draws upon the ontological and epistemological assumptions of pragmatism that differentiate it from both interpretivism and positivism (Creswell, 2003).
4. The study targets expanding language-related literacy practices, which requires a new research methodology (Bielaczyc & Collins, 2007). DBR begins with the basic assumption that existing educational practices are inadequate, or can, at least, be improved.

5. DBR was originally used for designing models to address emerging technological innovations. My main focus on Web-based new literacies is part of those innovations.
6. Pre-service EFL teacher education, where prospective teachers need to continuously develop their teaching/learning skills and educational practices, is an ideal context for conducting DBR (Cobb, Confrey, DiSessa, Lehrer, & Schauble, 2003).
7. EFL curriculum design is a main concern in the study. DBR contributes to three types of outputs: design principles, curricular products, and professional development of participants (Abdallah, 2011b).

Ontology and epistemology: Pragmatism as a basis for DBR

Any research process involves a particular view of the world and the nature of social reality that guides the researcher's choice of research paradigm, methodology, methods, and procedures. Grix (2004) argues that there are four main building blocks of research that are closely interrelated: ontology (i.e. the existence of something out there to know); epistemology (i.e. the means through which we can know about it); methodology (i.e. how we can go about acquiring that knowledge); methods (i.e. the precise procedures to be used to acquire it); and sources (i.e. the specific data that should be collected).

As far as DBR is concerned, any discussion of ontology should address the 'ontological innovation' concept devised by DiSessa and Cobb (2004) to express the continuous refinement of theoretical claims in reality to explain how the world works. The term means the "attributions we make to the world that necessarily participate in our deepest explanatory frameworks" (DiSessa & Cobb, 2004, p.84), and as a result, we find and validate a new category of existence.

This entails a pragmatic, contextual view of knowledge as an interactive process that involves many factors (e.g., personal, mental, and social), and therefore, its formation cannot be studied in isolation. In this regard, Crotty (2003, p.64) argues that "what is said to be 'the way things are' is really just 'the sense we make of them'". The quite different worlds which people inhabit constitute diverse ways of knowing and different sets of meanings.

Research should address questions of genuine interest to educators and the findings should involve useful implications for practitioners, and thus, a link should be made between theory and practice. Unlike many other disciplines (e.g., physical sciences) that employ scientific methodologies, educational research has social dimensions (Crotty, 2003; Pring, 2005) since it is conducted to address learning as a social phenomenon. However, the philosophical assumptions underlying educational research, such as claims about the duality between mind and matter (Crotty, 2003), or between "the objective world of physical things and the subjective world of meanings" (Pring, 2005, p.33), can cause difficulties for both researchers and practitioners, many of whom avoid such complicated arguments for the sake of focussing on practical research issues (Tashakorri & Teddlie, 1998).

As an alternative to the mind-matter dualism, the pragmatic approach to education, which dates back to Dewey (1929), posits a transactional realism, one in which reality only reveals itself as a result of the activities of the organism, and thus the focus should be on the "interactions between the living human organism and its environment" (Biesta & Burbules, 2003, p.10). Instead of separating mind from matter (real world), Dewey's pragmatism incorporates both of them into one entity conceptualising nature itself as "a moving whole of interacting parts"

(Dewey, 1929, p.232). Dewey did not want to identify his pragmatism with any of the two extremes (i.e. idealism vs. realism).

Thus, knowledge, from a pragmatic standpoint, is viewed as being collaboratively shaped by researchers and practitioners, and consequently, educational research should be viewed as a collaborative process aiming at simultaneously improving both theory and practice (Biesta & Burbules, 2003; Reeves, 2006).

Thus, pragmatism, as Tashakkori and Teddlie (1998) argue, has emerged as a grounding philosophy or approach to resolve the traditional conflict between two research paradigms (positivist and interpretivist/constructivist) in education and social science. More specifically, pragmatism, for me, contributes to this compromise on both the epistemological and methodological levels.

A clear link between pragmatism and DBR has been established. For example, Confrey (2006) states that pragmatism is more related to DBR than to experimental research as it does not place theory on a shelf to be used only as a guide to pristine experimentalism. Instead, it places it squarely into the real world of action and experience, and thus, it engages with complexity rather than striving to artificially reduce it. Similarly, the account given on the principles of pragmatism as an action-oriented approach guiding educational research implies a straightforward connection with DBR: (1) the immediate reality of solving educational problems should be the focus of educational research; (2) educational settings and problems can be studied using any method that accurately describes and solves problems; (3) educational research should strive to find ways to make education better; (4) researchers should collaborate with participants to fully understand what works; and (5) theories are useful tools in helping to improve education.

DBR as an emerging paradigm in educational research

In this section, I will elaborate more on DBR as an emerging paradigm. This involves shedding some light on its background, characteristics, and the criticism directed to it as well as the challenges associated with employing it in research studies.

DBR is the outcome of endeavours to forge a paradigm and/or methodology in education, which sits between the traditional randomised trials of experimental research that rely on controlling variables, and the qualitative approaches that provide deeper accounts (Kelly, 2007). It came to the fore as a new pragmatic approach taking many forms in various educational settings to bridge the gap between theory and practice, and thus improve educational practices and resolve problems attached to them (Cobb, et al, 2003).

Some factors stimulated the establishment of a new paradigm in educational research; one factor is the growing need to develop ‘usable knowledge’ that connects the researchers’ theoretical frameworks and understandings with the local context of practice. Increasingly, experts call for research to be judged not only on the merits of disciplined quality, but also on the adoption and impact in practice (DBRC, 2003); otherwise, educational research will not involve any direct pragmatic benefits or implications for the contexts in which teaching/learning takes place. Another factor relates to the motivation to linking educational research to the problems and/or issues of everyday practice and classroom environments with their richness, messiness, and complexity (Brown, 1992). A third factor involves meeting the need to develop

a design science of education, and the need for approaches to studying learning phenomena in the real world rather than the laboratory (Collins, Joseph, & Bielaczyc, 2004).

Collins et al. (2004) identify several needs central to the study of learning that DBR intends to address, and which rationalise establishing it as a new paradigm: (1) to address theoretical questions about the nature of learning in context; (2) to use approaches to studying the learning phenomena in the real world situations rather than the laboratory; (3) to go beyond narrow measures of learning; and (4) to derive research findings from formative evaluation.

DBR has been originally known in educational research as 'design experiments' (Brown, 1992), though the former term, as Sandoval and Bell (2004) suggest, is more comprehensive and obvious than the latter, which denotes a specific form of controlled experimentation that does not capture the breadth of the approach.

DBRC (2003) characterises DBR as a research paradigm which blends empirical research in education with the theory-driven design of learning environments. It is an emerging approach for understanding how, when, and why educational innovations work in practice, inquiring into the nature of learning in a complex system to refine generative or predictive theories of learning.

A persistent question is: why DBR now? According to Van den Akker, Gravemeijer, McKenney, and Nieveen (2006), there are three main motives for using DBR: (1) the desire to increase the relevance of research for educational policy and practice; (2) the goal of developing empirically-grounded theories through combined study of both the process of learning and the means supporting it; and (3) the aspiration of increasing the robustness of design practice.

There are many characteristics that distinguish DBR making it a unique approach. On a broad methodological level, DBR eliminates the boundary between design and research by making the design process an opportunity to advance the researchers' understanding of teaching, learning, and the educational systems (Abdallah, 2011b).

Van den Akker, et al. (2006) characterise DBR as being: (1) 'interventionist', since the research aims at designing interventions in real-world settings; (2) 'iterative', since it incorporates cycles of analysis, design/development, evaluation, and revision; (3) 'collaborative', since it involves active participation of practitioners in the various research stages and activities; (4) 'process-oriented', since the focus is on understanding and/or improving interventions, and hence, a black-box model of input–output measurement is avoided; (5) 'utility-oriented', since the merit of a design is measured in part by its practicality for users in real contexts; and (6) 'theory-driven', since the design is, partly at least, based on a conceptual framework and theoretical propositions, whilst the systematic evaluation of consecutive prototypes of the intervention contributes to theory building.

In the same vein, Bowler and Large (2008) characterise DBR as: (1) 'multi-purposed', as it serves theory, design, and practice; (2) 'contextual', in the sense that research is conducted in its real learning setting where researchers, practitioners, and users are part of the context; (3) 'flexible', as it uses a combination of (qualitative and quantitative) mixed methods as the need demands, and this flexibility is a strength in it; and (4) 'producing a working artefact' in the form of a curriculum, programme, learning environment, or a piece of software.

DBR involves using different and mixed methods in the processes of data collection and the evaluation and refinement of the design which help to increase the "objectivity, validity, credibility and applicability" of the findings. Some DBR authors suggest mixing different methods or the triangulation of data sources and respondents based on the fact that "the effectiveness of triangulation rests on the premise that the weaknesses in each single data resource will be compensated by the counterbalancing strength of another" (Abdallah, 2011b).

Criticism and challenges

There are a number of criticisms and challenges regarding DBR, since it is an emerging paradigm that has been recently adopted with enthusiasm. A significant area of criticism relates to the fact that DBR, compared with other research approaches and methodologies, can be 'over-methodologised', with excessive amounts of collected data and, subsequently, much required analysis (Brown, 1992). Brown elaborates on the different types and means of data collection (e.g., students' scripts, observations, records of students' portfolios, and extensive audio and video tapes) which also lead to another concern related to selection bias.

Being 'under-conceptualised' is another point (DiSessa & Cobb, 2004; Dede, 2005). According to Dede (2005), part of this shortfall may be attributed to the fact that the skills of creative designers and the attributes of rigorous scholars have limited overlap. Effective design-based research groups usually try to strike a balance between 'whatever works' for innovation and controlled, principled variations. People fascinated by artefacts often start with a predetermined solution and seek educational problems to which it can be applied, which ultimately leads to under-conceptualised research. However, Dede (2005) contends that under-conceptualising and over-methodologising are not intrinsic to DBR, as some design studies result in valuable findings using elegant collection and analysis strategies.

A third point relates to the 'difficulty of making generalisations' among participants. According to O'Donnell (2004), this may be because of the complexity involved in implementation. In addition, generalisation in DBR may be difficult due to the inability to control many variables in complex settings and to analyse in full the large amount of data collected before the next cycle.

In relation to the areas of criticism discussed above, there are a number of challenges for using DBR in this study. These challenges are addressed below with special focus on how to manage them in this particular context.

First, the *challenge of context and time span* was a significant problem. Herrington et al. (2007) argue that DBR is avoided by doctoral students who are expected to complete their degrees in 4-5 years, but, in a sense, they can make some adjustments. Initially I was reluctant to adopt DBR, especially because this PhD project should not exceed 4 years during which the field study in Egypt should be conducted within 3 months. To resolve this, I had to be flexible by decomposing the big research problem into specific tangible components (e.g., focussing on some new literacies based on the Web as they related to the English language skills) that could be tackled within this time span. Further research might be conducted to take my conclusions and design principles as a point of departure instead of re-inventing the wheel.

Second, the *challenge of validity and credibility* is persistent in DBR as it is a flexible methodology that uses both qualitative and quantitative methods for processing data without any controlled experimentation. Addressing this challenge, Bowel and Large (2008) contend that the contextual nature of DBR is the key answer. Although theory developed within a

controlled, laboratory environment may lay claim to external validity, it may lack ecological validity and, thus, makes no sense in the real world. The strength of DBR is that it happens in real context, and its resulting designs are able to meet certain local needs and be useful to practitioners, and hence, the validity issue can be addressed. Further, the practice of using multiple methods in DBR builds a body of evidence that may enhance and confirm the credibility of findings (Abdallah, 2011b).

It is not possible in most educational contexts to employ the so-called 'gold standard' experiments to the educational processes as is the case with randomised trials. Instead, design-based researchers utilise multiple, mixed methods to build up a body of evidence that supports the theoretical principles underlying a specific innovation and refines the innovation itself in context. Therefore, a useful practice for addressing any concerns related to reliability, validity, and credibility associated with DBR is to use triangulation as a research tactic which scholars perceive as a powerful way of demonstrating concurrent validity (Abdallah, 2011b).

Third, the *challenge of adaptability* is relevant. DBR is a flexible research design that is open to modifications and adaptations to be made as the context and research conditions require (Plomp, 2009). Further, design researchers should adapt themselves to other roles to play beside their fundamental role as researchers (e.g., the additional roles of designers, advisors, and facilitators) without losing sight of their primary role (Van den Akker et al., 2006; McKenney et al., 2006). This may complicate the process, but the good researcher knows how to balance these roles by realising when a role should be more dominant than another in a certain stage.

Last, the *challenge of rigour*: Some authors express some concerns related to rigour when DBR is conducted since it is still an emerging paradigm, which has not yet established its peculiar standards and criteria. Comparing it with experimental research that has long-established rigour and criteria. Using DBR raises many questions related to rigour such as how to ensure that we have adequately characterised an intervention that we did not entirely control; and how to generalise outcomes and results to other contexts. However, he contends that DBR can be more rigorous in certain ways; in particular, it is strong at helping with connecting interventions to outcomes and can lead to better alignment between theory, treatments, and measurement than experimental research in complex realistic settings like the classroom (Abdallah, 2011b).

5. Research framework: The three-phase DBR design

After introducing DBR as the main paradigm utilised, I introduce the research framework of the study which is based on a three-phase DBR design derived from Nieveen . (2009) and Plomp (2009). A diagram was devised (see Figure 1) to illustrate this framework through outlining the research methods and procedures followed in the three phases of this design study to accomplish my objectives.

I present here the main research framework, which delineates the organisation of the research methods and procedures under the DBR umbrella (see Figure 1).

Reeves (2006) depicts the DBR approach as a process which starts from the identification and analysis of problems by researchers and practitioners in collaboration; and then goes through the development of prototyping solutions informed by theories, existing design principles, and technological innovations; then involves iterative cycles of testing and refinement of solutions in practice; and finally, results in reflection to produce design principles and enhance solution implementation in practice.

Drawing on Nieveen et al. (2009), and Plomp (2009), the procedures and steps followed for conducting the study fall under three main research phases (see Figure 1 below):

1. The *preliminary phase,* in which the procedures of needs and content analysis, review of literature, and development of a conceptual or theoretical framework for the study are conducted. As indicated in Figure 1 below, this stage involves identifying and formulating the problem of the study through: online interactions with participants; a review of relevant empirical studies to identify the gap; and real interactions with both EFL student teachers and their educators (a long-term process that started already a few years ago). It also involves doing a comprehensive review of literature that serves two main purposes: (1) clarifying the key research terms (e.g., Web-based new literacies, EFL teacher education, and curriculum design); and (2) providing a theoretical foundation for the concurrent documentary analysis process. Finally, it involves collecting preliminary empirical data at this stage through: (1) a documentary analysis process that leads to a list of Web-based new literacies; (2) semi-structured interviews (conducted online with 19 EFL student teachers and educators at AUCOE) that leads to some Web-based facilities. Both products are necessary for informing the preliminary design framework that should guide the next stage of this design study (i.e. the prototyping phase). The arrows in Figure 1 below illustrate such relationships, and thus provide a conceptual diagram of how the process goes.

2. The *prototyping phase* (the iterative design phase), which consists of iterations, each being a micro-cycle of research with formative evaluation as the most important research activity aimed at improving and refining the intervention. As Figure 1 shows, this phase is guided by a preliminary design framework concluded in the preliminary phase. This is followed by a screening questionnaire administered for identifying a purposive sample to use in the prototyping phase. Each research cycle (as the arrows in Figure 1 indicate) leads to a revised framework based on results and which guides the next cycle, until a final design framework is reached.

3. The *assessment/reflective phase*, which concludes whether the solution or intervention meets the pre-determined specifications, resulting in recommendations for improving the intervention. In this phase, a final design framework is reached throughout a comprehensive assessment of the 2 iterations or research cycles conducted in the previous stage. This framework (as the arrows indicate) involves implications for EFL curriculum design, along with contributions to theory, practice, and methodology.

It is worth mentioning that throughout phases 1 and 2, the instruments and techniques used for data collection are developed in the light of the needs of the research and the specific purposes of the study. Both quantitative (e.g., online questionnaire) and qualitative (e.g., semi-structured interviews) data collection methods are used. Since the aim of this initial stage is to set the scene for the whole research project, it mainly involves direct interactions with the Egyptian context itself to formulate the necessary background data.

This background data is obtained through: (1) a short-term pilot study that involves some semi-structured interviews with both EFL student teachers and their educators. The main goal here is to obtain reflective accounts of the real problem in context and the realistic literacy needs of the target student teachers; (2) a documentary analysis of some online texts and accounts written by specialists in the field. The goal guiding this analysis is to formulate a comprehensive list of

those Web-based new literacies deemed important to EFL student teachers in the target context. Sometimes, some English language specialists and educators known for an interest in the Web and language learning were approached through e-mail to provide their accounts in the form of an essay or a list to be analysed later on. These accounts were useful throughout the documentary analysis process as they represented practical voices from the field. The documentary analysis process resulted in the formulation of a preliminary list of Web-based new literacies in which 73 items were suggested under four main categories which included other sub-categories:

1. Membership in online communities;
2. Composing and writing online;
3. Knowledge construction and idea sharing; and
4. Employing the Web as an online library and a main language-learning resource.

As a confirmatory procedure, these categories including the 73 items composing them were administered through an online questionnaire to Egyptian EFL student teachers and their educators to check the extent to which they were relevant and needed in Egypt; (3) semi-structured interviews were conducted online with 19 participants to identify which Web-based facilities (e.g., e-mail, chat, search engines, Facebook, and Wikis) are really needed in EFL teacher training, why they are needed, and how they can be employed for effective language-learning purposes.

As far as the next stage (i.e. the prototyping phase) is concerned, it is important to mention that the 36 participants were selected from among the target student teachers based on a screening questionnaire that determined which student teachers possessed the minimum level of knowledge and skills required for the interventions. Then, the first cycle (i.e. the CoP design) was conducted online for two months (while I was in England) with Egyptian participants, while the second cycle was conducted completely face-to-face with participants for three months.

I should admit that the Internet (as a research tool and means of communication, not just as a research topic) facilitated the process of data collection throughout the preliminary stage: the new literacies questionnaire was administered online, and the semi-structured interviews were conducted online by means of e-mail communication and chat. Otherwise, I should have travelled back to Egypt many times to administer those tools face-to-face to the target participants.

Moreover, this division into three phases was intended for organisational purposes. In reality, the phases were connected together as sometimes, I needed to build upon the empirical data in the preliminary phase to construct an initial design framework that would inform the procedures in the next phase. Similarly, the two cycles in the prototyping phase (i.e. both the CoP design and the Blended Learning design) were related. I needed to visit the first cycle sometimes to double-check something or notice something that could have helped with the next cycle.

In the preliminary phase, some methods and procedures of data collection and analysis were followed. After reviewing literature to provide a theoretical background, empirical data were needed to characterise the target context by identifying the literacy needs of the Egyptian EFL student teachers, with specific reference to AUCOE. The identification of these needs contributed to answering the first two research questions. Thus, a review of literature was conducted to inform a concurrent documentary analysis process with the aim of compiling

a Web-based new literacies list. The generated list in turn was administered through an online questionnaire to some Egyptian participants (n=50), consisting of both EFL student teachers and educators, with the aim of contextualising it within the target context. The fifty participants were identified online, and thus were the ones who were familiar with the topic, and also able to use the Internet and handle the online questionnaire properly.

To answer the second research question, semi-structured interviews were conducted to explore the Web-based facilities useful to them from the perspectives of both EFL student teachers and their educators. This list, along with the interview data, was used as resources to inform a preliminary design framework guiding the first iteration in the subsequent prototyping phase.
In addition, to identify based on certain criteria the required participants throughout a purposive sampling process, a screening questionnaire was prepared and administered face-to-face to the whole group of senior EFL student teachers at AUCOE as a procedure necessary for the prototyping phase.

Within the prototyping phase, which consisted of two iterations, the aim of the first iteration was to investigate through online interventional tasks the possibility of expanding EFL student teachers' language-related literacy practices while working online as a community. The interventional tasks were intended to gradually expose participants to some Web-based new literacies not familiar within their education programme. Throughout working as a community, participants started to develop many literacy skills.

Through this online intervention, some interventional tasks were administered online through e-mail communication on a daily basis for a two-month period. Those tasks included: (1) posting something on the group Blog; (2) commenting on a post made; (3) reading an article online; (4) sending feedback; (5) searching for something online; and (6) using a new online tool. In response to the tasks, participants contributed through e-mails, Blog posts, and feedback reports. These contributions were qualitatively analysed (by means of thematic analysis supported with NVivo software) to inform the process of evaluating the intervention by establishing some conclusions in the form of lessons learned to be cycled back into the next iteration. This should help with establishing a more comprehensive framework to guide the next iteration.
However, some weaknesses were observed that helped me to improve the design such as: (1) using the online alone was not effective as participants needed more direct interactions; (2) more training on using some online facilities like Wikis was needed; (3) there was a need for modifying the design framework to involve a blended socio-constructivist learning theory; and (4) more links with other academic courses studied by student teachers were needed.

In the second iteration of this design study, based on lessons learned from the first iteration as well as some empirical data from the preliminary stage, the preliminary framework that informed the first iteration was refined into a more comprehensive and detailed one to address the weaknesses which were observed in the previous CoP design. The second iteration was displayed as a micro-cycle of research that employed a blended learning design that involved a socio-constructivist theory of language learning facilitated by the web to resolve the weaknesses/shortcomings of the first iteration.
Based on the final results obtained from the second iteration, a final revised design framework was suggested. It included some implications for curriculum design in the target context. A final design framework was generated based on the results obtained from the two iterations, and thus the third and fourth questions of the study were answered.

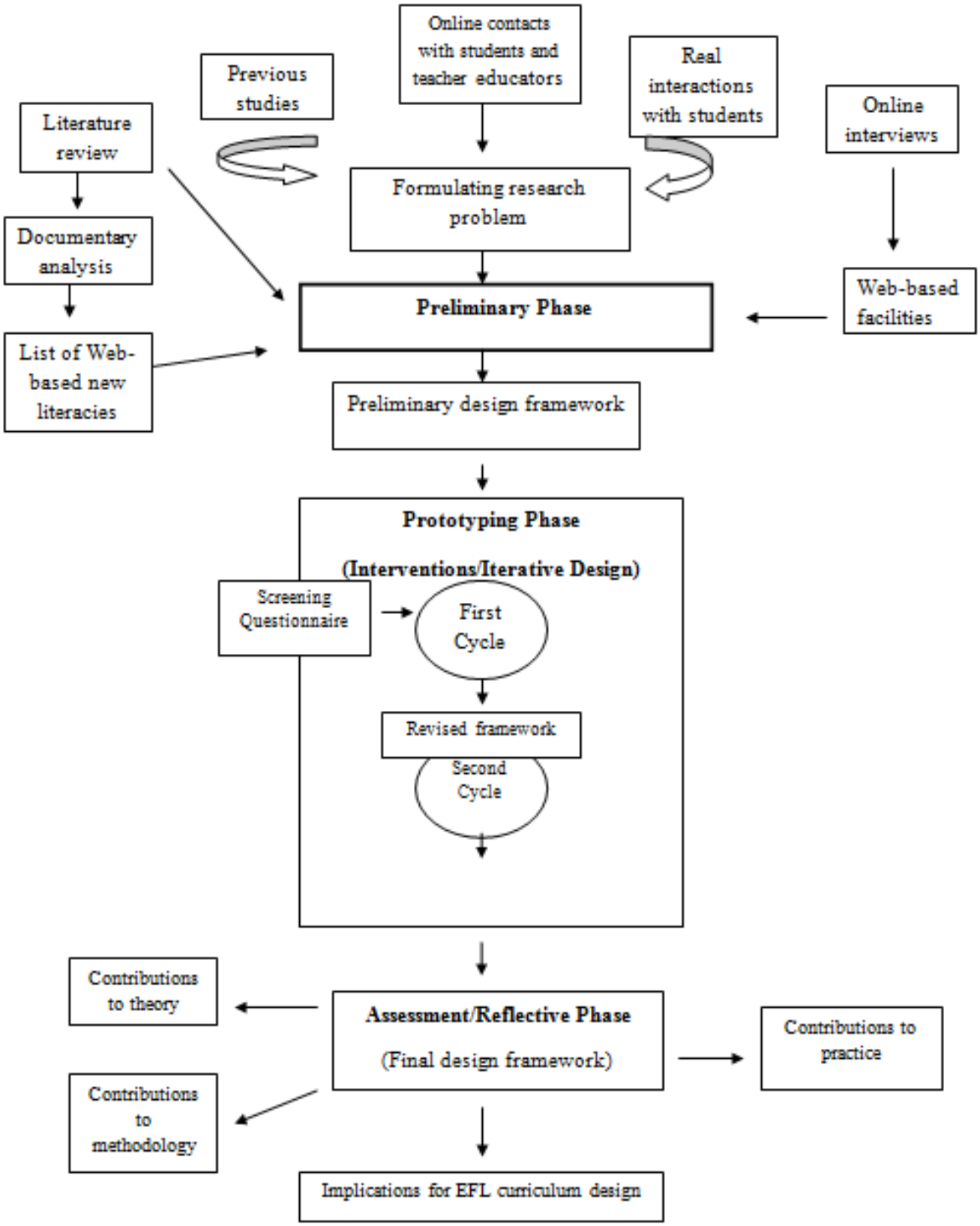

Figure 1: Research framework

The suggested design principles composing the final design framework were organised around five focal points: (1) learning design, (2) language learning theory, (3) course administration, (4) learning models and activities, and (5) Web-based facilities as online spaces for language learning and practice. These topics were intended only to classify these principles, not to create boundaries between them. Examples of those principles are:

- A blended learning design should be employed as a flexible solution for integrating Web-based new literacies into the target Egyptian context of AUCOE with the aim of expanding EFL student teachers' language-related literacy practices;
- Under the blended learning design, flexible shifts should be made during the lessons between face-to-face interactions and online interactions;
- Technical training on basic computer and Internet skills is an essential prerequisite for EFL student teachers to avoid and/or minimise technical problems that might occur while learning under the blended mode;
- While designing any courses for EFL student teachers that aim at involving them in new language-related literacy practices mediated by the Web, links should be made with other academic English language courses so that the usefulness and practicality of the course can be realised;
- Under the umbrella of blended learning, a dialogic, socio-constructivist pedagogy should be employed as an ELL approach that guides the process of expanding EFL student teachers' language-related literacy practices at AUCOE;
- EFL student teachers need to be gradually introduced to the dialogic, socio-constructivist pedagogy that is new to them so as to change their competitive learning attitudes and get used to learning together and supporting each other;
- Under a socio-constructivist pedagogy, the Web should be viewed from an 'affordances' perspective that stresses its dialogic, socio-cultural nature as well as its mediational function in literacy development and language learning;
- English should be the medium of instruction and the language of communication among student teachers both face-to-face and online, if language proficiency is the target;
- The lessons should reflect a gradual transition from controlled activities to collaborative/cooperative activities that involve pair work and group work, ending with some online independent tasks.
- A class Wiki is needed as an online platform for delivering the course, and as an online space where student teachers can practise online collaborative writing in English.

As far as the curriculum design orientation of the study is concerned, the two main curricular products resulting from the study are: (1) tasks (resulting from the first cycle), and (2) blended course (resulting from the second cycle). The blended course in turn involves three minor curricular products: a class Wiki, a class Blog, and an e-group. Student teachers' interactions with (and use of) those curricular products should eventually lead to professional development.

Key source

Abdallah, M.M.S. (2011b). *Web-based new literacies and EFL curriculum design in teacher education: A design study for expanding EFL student teachers' language-related literacy practices in an Egyptian pre-service teacher education programme*. Doctoral dissertation. Exeter, UK: University of Exeter. Available at:
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Mahmoud Abdallah (1976) works as Lecturer of Curriculum and English Teaching Methodology at Assiut University College of Education (AUCOE), Egypt. In June 1997, he got his BA in Literature and Education (English) at AUCOE with an honourable degree. Following graduation, he worked as a teacher of English at preparatory stage, and thus gained some experience in TEFL/TESOL and school-based practices. Based on his BA high scores, he was appointed in 1998 by Assiut University as Teaching Assistant at the Curriculum and Instruction Dept (TESOL/TEFL). In 2000, he finished his post-graduate diploma in Education at AUCOE. In July 2005, he got his MA in Education (Curriculum & TEFL methodology) with an excellent degree.

Based on his MA and TOEFL scores, he was nominated by the Egyptian Scholarship Department to get a fully-sponsored governmental scholarship to pursue his PhD degree at the University of Exeter, England, UK, and in 2011, he got his PhD. Dr Abdallah is mainly interested in the relationship between new technologies and language teaching/learning, especially the affordances/possibilities enabled by the Web for English language learning and practice. In this regard, he has published two books and many articles.

E-mail: msayed40@yahoo.com